

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the application of:

Applicants: Matthew L. Bisque et al.

Serial Number: 10/041,971

Art Unit: 2179

Filed: January 2, 2002

Examiner: Mylinh T. Tran

For: SYSTEM FOR OPERATING AN ASTRONOMICAL OBSERVATORY OVER A  
NETWORK

**DECLARATION UNDER 37 CFR 1.131**

Commissioner of Patents

Alexandria, Virginia 22313

Sir:

The undersigned inventors/applicants declare that claims 1-30 of the subject patent application have been rejected under 35 U.S.C.102(e) based on U.S. Patent Application Publication 2002/0173877 to Zweig. This published patent application, in the examiner's opinion, discloses a similar invention to the invention described in the subject patent application.

The Zweig application does not claim the same patentable invention as described in the subject patent application. The Zweig application includes 25 claims dealing specifically with a computerized mobile robot with an onboard internet web server. The web server is used to communicate with a remote web server on the internet for receiving robotic control commands. The subject patent application includes 30 claims dealing specifically with a system for operating an astronomical observatory at a fixed location. The system includes a web browser and a web server for communication with a set of astronomical hardware located at the observatory's site for making celestial observations.

The undersigned inventors/applicants declare that the invention described in the subject patent applicant was conceived and reduced to practice before the filing date of the Zweig patent application. The filing date of the Zweig patent application is January 14, 2002 and based on an earlier filed Provisional application filed on January 16, 2001.

The undersigned inventors declare that the Zweig patent application was not published more than one year prior to the date the subject patent application was filed in the U.S. Patent and Trademark Office. The subject patent application was filed in the Patent Office on January 2, 2002. The Zweig application was published on November 21, 2002.

The undersigned inventors/applicants declare that the following facts, shown in the enclosed Exhibit A, clearly show that the System for Operating an Astronomical Observatory over a Network described in the subject patent application was conceived and reduced to practice prior to the effective date or the filing date of January 16, 2001 of the Zweig published patent application. The Exhibits are as follows:

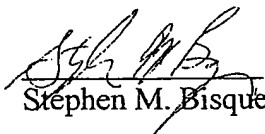
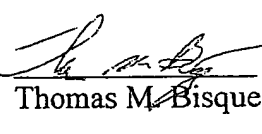
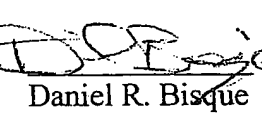
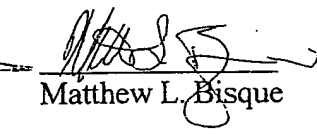
Exhibit A. An 8 page detailed description of the Astronomical Observation System and dated August 14, 2000. Pages 1 and 2 discuss a Background of the Invention, the Problems Solved and a Summary of the Invention. Pages 3, 4 and 5 disclose the Method of Controlling the Observatory using a Web Browser, the Configurations of the Browser Control of an Observatory, Observatory Control Transparency and Typical Night Sessions using the Observatory System. Pages 6, 7 and 8 disclose block diagrams of the invention. FIG. 1 illustrates the various features of the Astronomical Observatory System. FIGS. 2-7 illustrate the connections of the System with the CPU, the Web Browser, the Web Server, the Telescope Manager, the Camera Manager and the Dome Manager.

Exhibit B is a copy of the USPTO Filing Receipt for a Provisional Patent Application on the subject System for Operating an Astronomical Observatory over a Network. The Provisional Patent Application was filed in the Patent Office on January 29, 2001 and based on the invention disclosure described in Exhibit A. The subject Non-Provisional patent application is based on the disclosure in the Provisional Patent Application.

Based on the above facts and detailed description of the invention dated August 14, 2000 and found in Exhibit A, the published patent application to Zweig should now be removed as a cited reference in the prosecution of the subject patent application.

The undersigned applicants/inventors declare further that all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed at Golden, Colorado on this 12 day of October 2005.

			
Stephen M. Bisque	Thomas M. Bisque	Daniel R. Bisque	Matthew L. Bisque

**Patent on Internet Astronomy**

Revision B Last Modified: 8/14/00 5:57:55 PM ✓

See manual diagrams two pages.

**I. Title: Internet Astronomy****II. Background****a. Problems solved:**

- i. Clients get to use the sky of locations other than where they are or even where they are.
- ii. Clients get the benefits of various kinds of astronomical hardware devices (that might otherwise never be obtainable period or due to price).
- iii. Doing astronomy during the daytime.
- iv. Doing astronomy in the comfort of you home (rather than being outside).
- v. Clients get a broad choice of places to do astronomy.
- vi. Observatories get a standard way to control their site.
- vii. Observatories get a standard way to allow clients access to their site.
- viii. Clients cannot misuse observatories.
- ix. Those with physical disabilities are able to do this kind of astronomy.
- x. Observatories and clients get a device independent way of controlling various astronomical hardware products from various vendors. No particular device or vendor needs to be specified.
- xi. The telescope ends up where it is supposed to through TPoint.
- xii. Astronomical data acquisition is done either interactively or through scripting.
- xiii. Astronomical data reduction is done in a standard way.
- xiv. The ability to locate various celestial bodies (galaxies, stars, planets, asteroids, comets)
- xv. Doing astronomy is possible for those of all ages (young to old).
- xvi. Taking long CCD exposures of celestial objects.
- xvii. Seamless integration of astronomical hardware (telescope, camera, filter wheel, focus, dew heater, AO, dome, dome shutter, weather station (stretch), etc.)
- xviii. Allows clients to use a slow dialup connection to do the control because information passed between client and server is optimized.
- xix. Graphical database of celestial objects.

**b. How others have attempted to solve this problem:**

- i. Bradford robotic telescope
- ii. Torus Precision Optics
- iii. Using "remote control" software packages

**III. Summary of the Invention**

- a. Bradford's control is through scripting, not real-time. Torus does not have Web based client. Remote control software is typically slow.
- b. Web based front end that allows maximum possible client access.

**IV. Other Documents**

- a. TheSky Astronomy Software and User Manual. CCDSoft Astronomy software and User manual. TPoint and its user manual. Paramount Mount and manual. IAServer/IAClient manuals. Orchestrate software and manual.

**V. Confidential Disclosures**

- a. ???

**VI. Description of the Invention****General Questions**

What are we getting a patent?

Browser Control of An Observatory

Questions for Ben

1. While "Patent Pending," does that prevent our competitor for copying us?
2. Once publically released, we loose all foreign patent rights. We have one year to file a for a US patent.
3. If you patent a process or method that someone else can do part of and "fakes" the rest, is that OK?
4. If someone could do something manually (pulling parts together) and then we do it under one roof, is that patent?
5. We cannot patent non-browser control of an observatory because 3 years have gone by. We started to distribute our RAS (Internet control) software about three years ago. This is specialized client software, not web browser-based software. Should this preclude us from attempting a patent on using the Internet to control an observatory (as opposed to web browser control). Yes!

Potential Patents

1. Dark Frame Database.
2. Splice in a script.
3. Star Charts on the Web.
4. Direct Guide.
5. ImageLink.
6. Method for making high precision gears.

## A Method for Controlling an Observatory Using a Web Browser

I know I might get protocol specific, but that is out of habit and can be avoided entirely I think.

I might write things down as they are, but they will have to be generalized.

### Client Authentication

The client will have one or more instances of a web browser running. Each instance of the web browser must provide a set of credentials (user name and password) that is authenticated by the observatory when the client logs on. If the client is local to the observatory, securely connected or on a dedicated single connection to the observatory, authentication may not be required. (Do I have to say that? Or is it obvious? If one aspect of control does not necessarily have to be there should it be stated explicitly?)

The User Manager will do the client authentication. The user manager will also specify the client a clearance level-that level dictates what functionality he can use. For example, at Administrator clearance level the client is not prohibited from doing anything, while at User clearance level the client might be prohibited from altering camera focus. The clearance level is set by those who own/run the observatory itself.

### Single/Multiple Instances of Browser

Multiple browser instances could allow each instance to control a certain aspect of the observatory-or a single instance of a browser may provide control to all aspects of the observatory-certain aspects may be grouped together naturally (like dome and weather) in one browser instance while other browser instances group other aspects of control together. The nature of the web browser also means that the instances need not be on a single computer.

The reason I am hounding on the multiple instance point, is that if it were stated as just "a web browser", someone could do observatory control with several "web browsers". I guess that is what I am protecting against. Should I do that? Maybe I should leave that up to Ben, but that may or may not be obvious to Ben.

### Covering all possible configurations of Browser Control of an Observatory

I am afraid someone else will be able to get around the patent if I don't at least describe all the possible ways this could be done. Can we cover them all? Maybe after I get them all down we can write this is a way that covers them all. If we do just one way, competitors could side step our patent doing it the other way, but they are all kind of similar, valid, each has its advantages, etc. They are different enough I think that they could constitute a different method. Maybe I am trying to cover too many bases.

1. The observatory being controlled may connected directly to the computer running the web browser. For example, the cables that communicate with the telescope,

camera, dome, etc, connect to the computer running the browser. Here, the browser communicates directly through the web server and indirectly with the "managers" (services, daemons, servers, in-proc servers, out of proc servers) running on the same computer. This is a special case, as the nature of the web browser is not really being exploited (i.e. communication across a network), never-the-less it is a completely valid and useful means of observatory control. This type of scenario typically "falls out" of the case when the system is designed to be used from a far (not local). From a programming standpoint this is overkill as no cross machine communication (socket, HTTP, XML) is necessary.

2. The second most common case is when the browser is running on one machine and connected to and communicates with the "managers" running on another machine. (Brainstorm-the entire patent could be written as "Remote Control of An Observatory"- I just visualized how the browser is merely using the HTTP protocol as a stub or standard way to communicate with the observatory "daemons." I guess I cannot do this because we already have released this to the public .)
3. As browser become more adept at running JavaApps (JavaApps are applications that are downloaded at page time and are essentially applications that run local to the browser)- the daemons run in process with the browser-what is sent over the wire is what is sent directly to the hardware. In this case, the HTTP protocol is merely a wrapper for the device dependent packets being sent to the observatory hardware. A slight variation would be to have an all encompassing protocol manager at the server end that routes packet and translates (becomes a "manager") packets appropriately.
4. This case would be any all combination of local/out of proc daemons/inproc daemons.
5. Local/Remote transparency-i.e. "managers" daisy chain their communication to a network stub that is connected to the actual device elsewhere. I think this would be a stretch for enemies to get around our patent in that it eventually resolves to what our does.

Where the "managers" run will also be a way for our competitors to get around our patent.

### **Observatory Control Transparency**

The biggest part of this patent is how we leverage the browsers ability to be at some distance from the observatory while still giving the client the necessary functions and feed back to successfully utilize or control the observatory. This is also a unique aspect of the Internet in that the client gets to take advantage of the server's location.

### **Interactive vs. Scripted Use**

I want to cover both.

### **Single System Vs. Cluster or Farms of Systems**

I am not sure what I've started here covers the telescope farm case. The difference being is the fact that what I've been describing is real-time control, that is one user controls one

system in real-time. In the farm case, what is likely is that there dozens and dozens of clients and control is then move from real-time control to either 1) the client waits his turn for his request to become real-time [it degrades to exactly what I've described] or 2) the requests are queued and clients wait and or check back regularly for the progress/completion of their request or they notified via email upon completion of their request.

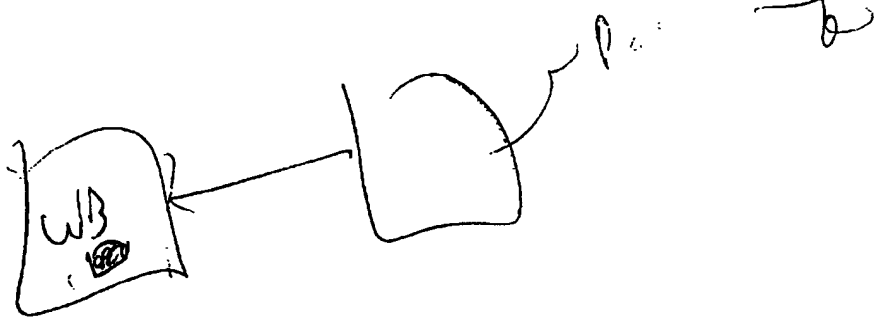
### Typical Night Session

- START UP*
1. Start browser.
  2. Logon to observatory.
  3. Check weather.
  4. Open dome. Let telescope/optics come to temperature (wait xx minutes).
  5. Power telescope (unparks automatically).
  6. Power Imager and Autoguider. Set temperature and wait for temperature to be reached.
  7. Focus Imager and Autoguider.

*SS.*

Repeat Throughout Night  
 Slew telescope to desired object  
 Take Picture

- GET W/*
8. Park telescope.
  9. Power off telescope.
  10. Set and wait for Imager and Autoguider temperature to come to ambient.
  11. Power off the Imager and Autoguider.
  12. Close dome.
  13. Visual verify dome/telescope state via Observatory cam.
  14. Logoff observatory.
  15. Exit browser.





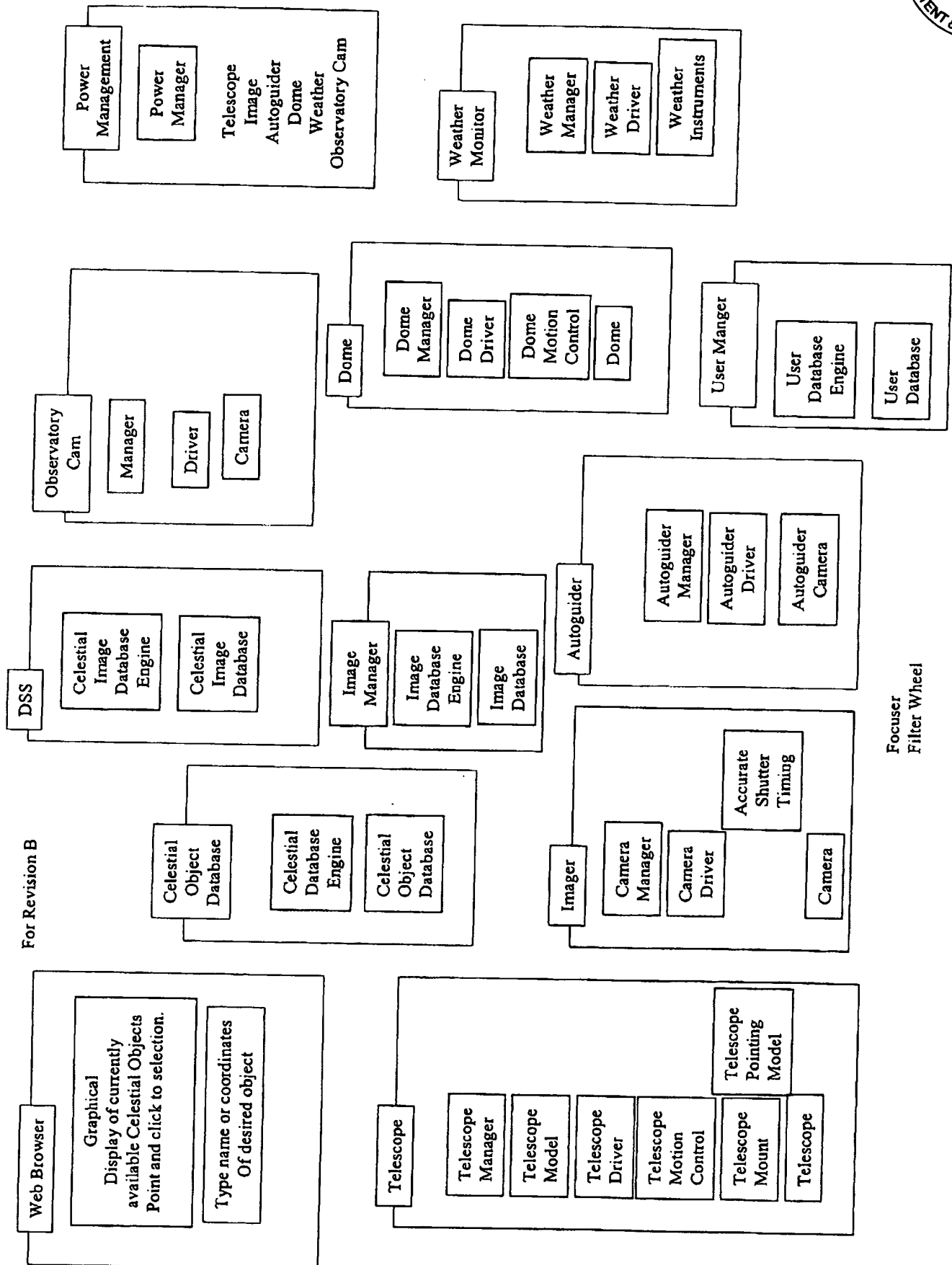
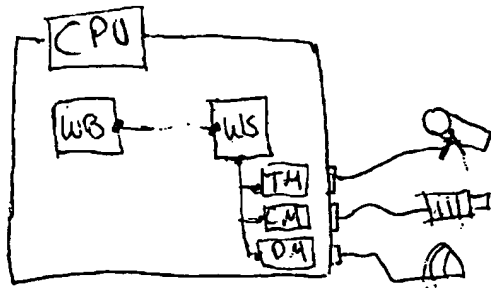


FIG. 1

①

FOR: REV B



CPU = A PC or computer w/ one processor

WB = Web Browser

WS = Web Server (IIS)

TM = Telescope Manager

CM = Camera Manager

DM = Dome Manager

FIG.2

②

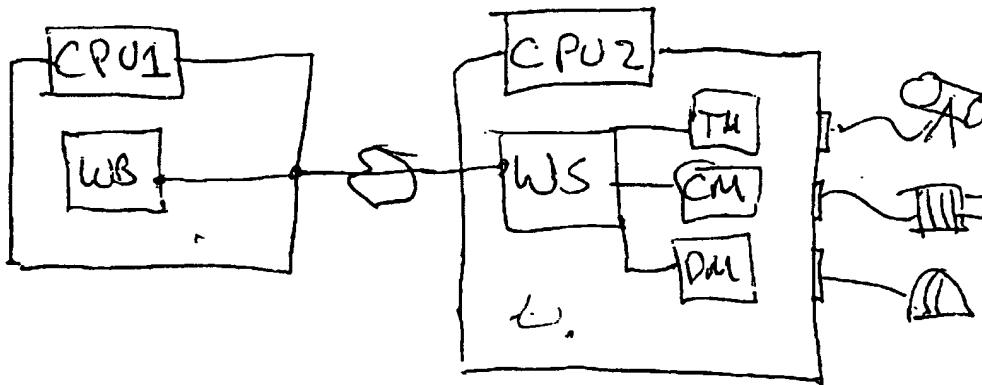


FIG.3

③

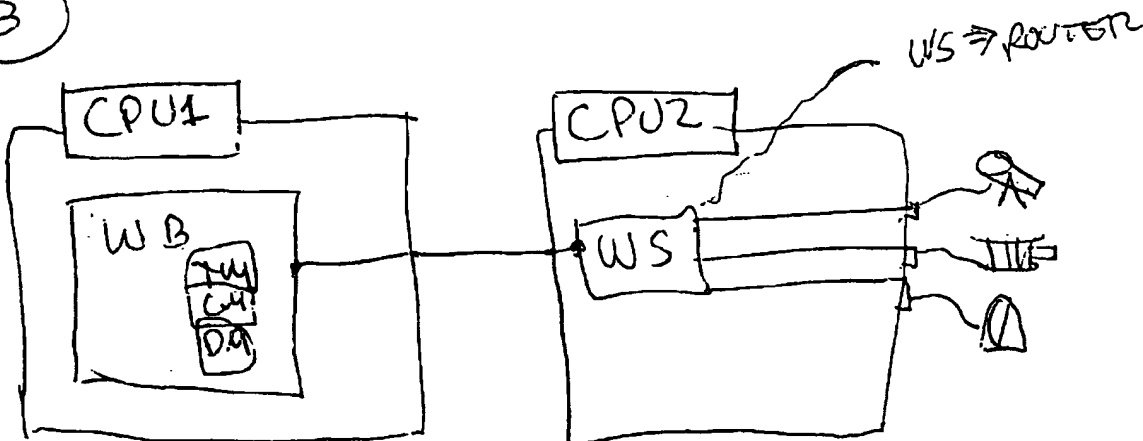
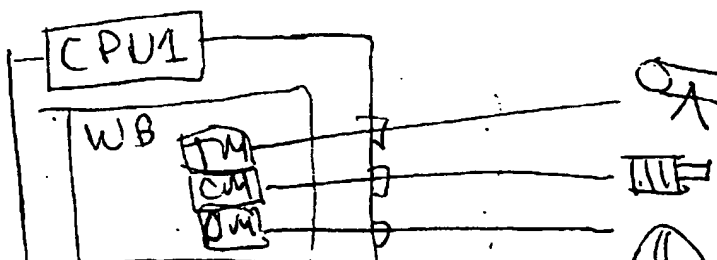


FIG.4

3A

ALL RUN  
AS 1 UNIT

7.

THIS CASE  
CANNOT BE  
REMOTE ACROSS  
THE WORLD - COV'D  
CABLES ONLY

THIS

PREVENTS OUR  
ENHANCING FROM  
USING WEB  
TO PC

FIG.5



(3B)

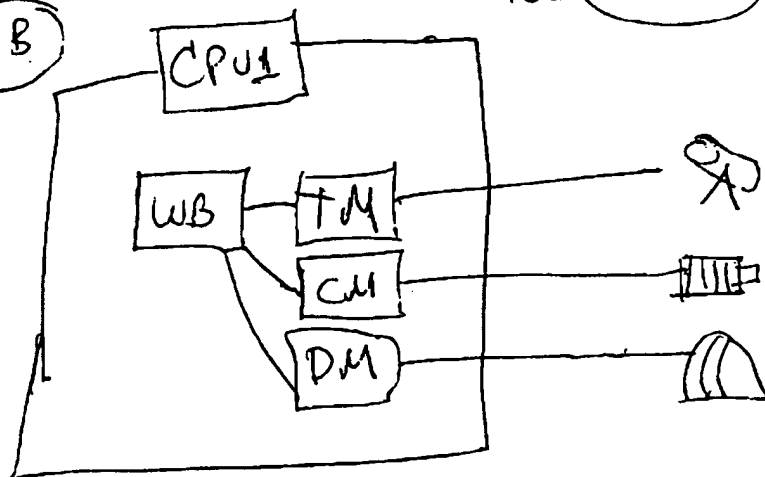
AGAW  
LONG  
CABLES  
ONLY

FIG. 6

RUN AS "OUT OF  
PROCESSORS

④ N COMBINATIONS OF WHERE WB RUNS

⑤

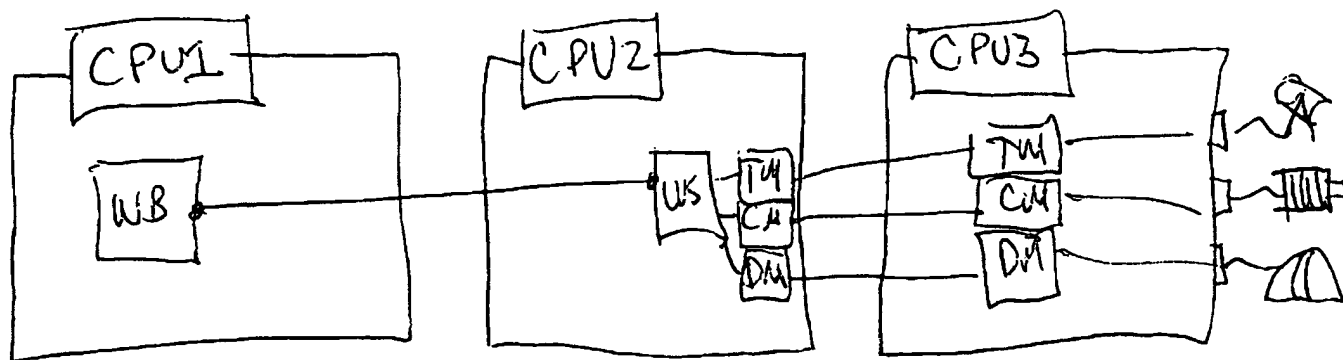
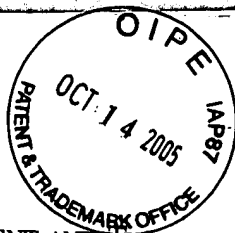


FIG. 7.

Exhibit B



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
60/264,302	01/29/2001		75		6		

CONFIRMATION NO. 8941

FILING RECEIPT



\*OC000000005965205\*

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Date Mailed: 04/13/2001

Receipt is acknowledged of this provisional Patent Application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the PTO processes the reply to the Notice, the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

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Thomas M. Bisque, Golden, CO;

If Required, Foreign Filing License Granted 04/12/2001

Projected Publication Date: N/A

Non-Publication Request: No

Early Publication Request: No

\*\* SMALL ENTITY \*\*

Title

System and method for operating an observatory using a web browser

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Data entry by : MELAKU, AIDA

Team : OIPE

Date: 04/13/2001

